

# TITLE:INFRARED EMITTER

## BACKGROUND OF THE INVENTION

### 1. Field of the invention

The present invention is related to an infrared emitter, and  
5 especially to an infrared emitter taking advantage of the mode of  
arrangement of a plurality of infrared emitting diodes in a photodiode  
emitting-medium to inhibit disturbance of crosstalk, the emitter is  
applied to industries of audio/video playing, car audio/video equipment  
and hi-fi equipment.

### 10 2. Description of the Prior Art

The living standards of the people in the world are continuously  
elevated, people think more and more highly of the life of leisure and  
the quality of life. The fond of enjoyment of audio-video amusements of  
people are extremely eager as to have specific spaces for audio-video  
15 amusements in their homes in order to enjoy acoustic and optic  
appreciations of as those used to be provided only in the highest class  
for a national music hall. While audio-video equipment for providing  
audio-video amusements can not only give the viewers/listeners the  
images of clear pictures to satisfy acoustic and optic feelings, but to  
20 provide necessary emergence of sounds; it is always the goal of the  
manufacturers of the art to satisfy acoustic feeling of listeners in  
enjoying natural as well as clear sounds.

Manufacturers of the art nowadays use two infrared RF emitters to  
receive the sounds from left sound channel and right sound channel,  
25 then simultaneously make transmission of the amplified sounds of the

left sound channel and right sound channel in the mode of FM carrier wave, and lastly, have the sounds of the left sound channel and right sound channel transmitted to wireless earphones by means of Darlington amplifying circuits in the photodiode emitting-media and 8 infrared diodes arranged on the parts of the photodiode emitting-media.

The above stated mode of transmission has the following flaws:

1. It can create a phenomenon of triggering among different emitting frequencies to in turn create crosstalk, i.e., during the transmission process, signal sources with different frequencies are heard to have impure sounds not from the emitter. For example, a listener listening to a first channel hears the sounds from a second channel. This is crosstalk created by ununiform distribution of energy of frequency of the light in the air.
2. The other way is to use two infrared RF emitters and 8 infrared diodes to inhibit the problem of crosstalk; the design of circuitry for them is more complicated, and the cost of production is high that does not meet the tendency for electronic products to be light, thin and small.

In view of the above stated, the present invention is developed to overcome the conventional flaws.

## SUMMARY OF THE INVENTION

The main objective of the present invention is to provide an infrared emitter using the mode of arrangement of a plurality of infrared emitting diodes and Darlington amplifying circuits on the parts of a photodiode emitting-medium to inhibit disturbance of crosstalk during

transmitting carrier waves, and the cost of production is lowered to meet the requirements that electronic products are to be light, thin and small.

In order to achieve the above objective of the present invention, the infrared emitter of the present invention has:

5        a preamplifier of which one end receives the input source of sounds of left sound channel and right sound channel, the other end emits the sounds of the left sound channel and the right sound channel;

         an infrared RF emitter including a channel A, a channel B and two set of mixers; the channel A includes a left sound channel of 2.3 MHz  
10       and a right sound channel of 2.8 MHz, the channel B includes a left sound channel of 3.2 MHz and a right sound channel of 3.8 MHz; one end of the infrared RF emitter is used to receive amplified sounds of the left sound channel and right sound channel of the preamplifier; the other end is used to emit the sounds of the left sound channel and the right  
15       sound channel wirelessly in a mode of FM carrier wave;

         an infrared channel controller connecting with the infrared RF emitter for switching between the channel A and the channel B in the infrared RF emitter;

         and a photodiode emitting-medium to receive and emit the sounds  
20       of the channel A and the channel B emitted from the infrared RF emitter, the photodiode emitting-medium includes two Darlington amplifying circuits and four diodes A, B, C and D, wherein the diodes A, B are infrared emitting diodes for left sound channel, and the diodes C, D are infrared emitting diodes for right sound channel; one of the  
25       abovementioned Darlington amplifying circuits is juxtaposed with the

infrared emitting diodes A, C, the other of the Darlington amplifying circuits is juxtaposed with the infrared emitting diodes B, D; and the infrared emitting diode A is of 2.3 MHz, the infrared emitting diode B is of 2.8 MHz, the infrared emitting diode C is of 3.2 MHz, while the  
5 infrared emitting diode D is of 3.8 MHz. Thereby, crosstalk phenomenon of abnormal channels can be overcome by switching between the channel A and the channel B with the infrared channel controller and by the mode of arrangement of a plurality of infrared emitting diodes on the parts in the photodiode emitting-medium, as well as by using two set  
10 of mixers to control the respective energy adjustment of the diodes A and B (2.3 MHz, 2.8 MHz), or of the diodes C and D (3.2 MHz, 3.8 MHz).

The present invention will be apparent after reading the detailed description of the preferred embodiment thereof in reference to the  
15 accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing the process flow of an infrared emitter of the present invention;

Fig. 2 includes Fig. 2A and Fig. 2B which show circuit diagrams of  
20 a preamplifier and are connected with each other, wherein,

Fig. 2A is a circuit diagram of part of the preamplifier of the infrared emitter of the present invention; and

Fig. 2B is a circuit diagram of the other part of the preamplifier of the infrared emitter of the present invention;

25 Fig. 3 includes Fig.3A, Fig.3B and Fig.3C which include an

infrared channel controller, an infrared RF emitter and a photodiode emitting-medium, and are mutually connected, wherein,

Fig. 3A is a circuit diagram of the infrared channel controller of the infrared emitter of the present invention;

5 Fig. 3B is a circuit diagram of the infrared RF emitter of the infrared emitter of the present invention; and

Fig. 3C is a circuit diagram of the photodiode emitting-medium of the infrared emitter of the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

10 Referring to Figs. 1-3C in the drawings, the infrared emitter 1 of the present invention comprises a preamplifier 10, an infrared RF emitter 20, an infrared channel controller 30 and a photodiode emitting-medium 40. The points I, J, K, L, M, N, O, and P shown in Fig. 3A are connected to the corresponding points I, J, K, L, M, N, O, and P  
15 shown in Fig. 3B; and the point Q shown in Fig. 3C is connected to the corresponding point Q shown in Fig. 3B.

As shown in Figs. 1, 2A and 2B, one end of the preamplifier 10 receives the input source of sounds of left sound channel and right sound channel, the other end amplifies and emits the sounds of the left  
20 sound channel and right sound channel; the points E, F, G and H shown in Fig. 2A are connected to the corresponding points E, F, G and H shown in Fig. 2B.

As shown in Figs. 1 and 3B, the infrared RF emitter 20 includes a channel A, a channel B and two set of mixers 90, the channel A includes  
25 a left sound channel of 2.3 MHz and a right sound channel of 2.8 MHz;

the channel B includes a left sound channel of 3.2 MHz and a right sound channel of 3.8 MHz; one end of the infrared RF emitter 20 is used to receive amplified sounds of the left sound channel and right sound channel of the preamplifier; the other end is used to emit the sounds of the left sound channel and right sound channel wirelessly in a mode of FM carrier wave.

As shown in Figs. 1, 3A and 3B, the infrared channel controller 30 is connected with the infrared RF emitter 20 for switching between the channel A and the channel B in the infrared RF emitter 20.

As shown in Figs. 1, 3B and 3C, the photodiode emitting-medium 40 is used to receive and emit the sounds of the channel A and the channel B emitted from the infrared RF emitter 20, the photodiode emitting-medium 40 includes two Darlington amplifying circuits 100 and four diodes A, B, C and D, wherein the diodes A, B are infrared emitting diodes for left sound channel, and the diodes C, D are infrared emitting diodes for right sound channel; one of the abovementioned Darlington amplifying circuits 100 is juxtaposed with the infrared emitting diodes A, C, the other of the Darlington amplifying circuits 100 is juxtaposed with the infrared emitting diodes B, D; and the infrared emitting diode A is of 2.3 MHz, the infrared emitting diode B is of 2.8 MHz, the infrared emitting diode C is of 3.2 MHz, while the infrared emitting diode D is of 3.8 MHz.

As shown in Figs. 1-3C, in operation of the present invention, one end of the preamplifier 10 receives the input source of sounds of its left sound channel and right sound channel in the first place, then the other

end amplifies and emits the sounds of the left sound channel and right sound channel to the infrared RF emitter 20. One end of the infrared RF emitter 20 is used to receive the amplified sounds of the left sound channel and right sound channel from the preamplifier 10; and by using  
5 an integrated circuit of the infrared channel controller 30, i.e., by switching between the channel A and the channel B which are of FM in the infrared RF emitter 20 in a mode of controlling the values of impedances, the channel A includes the left sound channel of 2.3 MHz and the right sound channel of 2.8 MHz, the channel B includes the left  
10 sound channel of 3.2 MHz and the right sound channel of 3.8 MHz. Thereafter, the other end of the infrared RF emitter 20 is used to emit the sounds of the left sound channel and right sound channel wirelessly in a mode of FM carrier wave to the photodiode emitting-medium 40. Wherein arrangement of the parts of the circuit of the photodiode  
15 emitting-medium 40 is as below:

As shown in Figs. 3B and 3C, with the two Darlington amplifying circuits 100 and four diodes A, B, C and D, wherein the diodes A, B are infrared emitting diodes for left sound channel, and the diodes C, D are infrared emitting diodes for right sound channel; one of the  
20 abovementioned Darlington amplifying circuits 100 is juxtaposed with the infrared emitting diodes A, C, the other of the Darlington amplifying circuits 100 is juxtaposed with the infrared emitting diodes B, D; and the infrared emitting diode A is of 2.3 MHz, the infrared emitting diode B is of 2.8 MHz, the infrared emitting diode C is of 3.2 MHz, while the  
25 infrared emitting diode D is of 3.8 MHz; also two set of mixers 90 are

used to control energy adjustment of the diodes A and B (2.3 MHz, 2.8 MHz), or C and D (3.2 MHz, 3.8 MHz), thereby a function that crosstalk phenomenon of abnormal channels can be gotten rid of is effected in lieu of the function of the two emitters used in a conventional way.

5       As stated above, the two Darlington amplifying circuits 100 and four diodes A, B, C and D in the photodiode emitting-medium 40 are arranged in the above stated way, so that energy can be uniformly distributed, and one end of the photodiode emitting-medium 40 is used to receive the sounds of the channel A and the channel B emitted from  
10   the infrared RF emitter 20, and generation of crosstalk can be inhibited when the other end transmits the carrier waves to a wireless earphone 50.

Thereby, the present invention has the following advantages:

1. By the fact that the present invention only uses one infrared RF  
15   emitter and four infrared emitting diodes, material used is less, and the cost of production is lower, this more meets the requirement that electronic products are to be light, thin and small.
2. Arrangement of the two Darlington amplifying circuits and four  
20   infrared emitting diodes on the parts of the photodiode emitting-medium can render distribution of energy uniform, and generation of crosstalk can be effectively inhibited when in transmitting the carrier waves.

In conclusion, the present invention can achieve the expected objective thereof to provide an infrared emitter with industrial value of  
25   utilization.



The above statement given is only for illustrating the present invention, and not for giving any limitation to the scope of the present invention. It will be apparent to those skilled in this art that various modifications or changes without departing from the spirit of this invention shall also fall within the scope of the appended claims.

10

15

20

25